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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/624,830	07/21/2003	Glenn Ratificar	42P12684C	6572

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EXAMINER	
EDMONDSON, LYNNE RENEE	
ART UNIT	**PAPER NUMBER**
1725	

DATE MAILED: 11/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/624,830	RATIFICAR ET AL.	
	Examiner	Art Unit	
	Lynne Edmondson	1725	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 September 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *14-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *14-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 14-17 and 19-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Casson et al. (USPN 5261593).

Casson teaches a mechanical joint comprising a bump and solder paste between a die and a substrate (figure 5A and col 9 lines 1-38). The bump has a columnar form and comprises Cu and Pb:Sn solder (figure 2D and col 7 lines 43-58). Although the structure of the joint is the same regardless of the type of reflow employed, it is noted that infrared energy was used (col 11 lines 54-67 and col 13 lines 28-40). A joint formed by vapor phase reflow has same structure and properties as a microwave reflow joint. However in the instant claims the assembly will presumably be exposed to microwave radiation in the future, no exposure has occurred at this point. Although the reference teaches electroplating metals, a screen-printed bump would have similar characteristics.

3. Claims 14-17, 19 and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Sweitzer (USPN 5615477).

Sweitzer teaches a mechanical joint comprising a bump and solder between a die and a substrate exposed to infrared radiation (col 5 lines 7-43 and col 7 line 55 – col 8 line 12). However it is noted that the structure of the joint is the same regardless of the type of reflow employed. A joint formed by convection reflow has same structure and properties as a microwave reflow joint. However in the instant claims the assembly will presumably be exposed to microwave radiation in the future, no exposure has occurred at this point. It is noted that a screen-printed bump would have similar characteristics as an electroplated bum.

4. Claims 14-17, 19 and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Koopman et al. (USPN 5992729).

Koopman teaches a mechanical joint comprising a bump on a die (col 6 line 66 – col 7 line 18) and Pb:Sn solder on a substrate (figure 5A and col 9 lines 1-38), exposed to microwave energy and reflowed with radiant energy. However it is noted that the structure of the joint is the same regardless of the type of reflow employed. A joint formed by convection reflow has same structure and properties as a microwave reflow joint. However in the instant claims the assembly will presumably be exposed to microwave radiation in the future, no exposure has occurred at this point. It is noted that a screen-printed bump would have similar characteristics as an electroplated bum.

5. Claims 14-17 and 19-21 are rejected under 35 U.S.C. 102(e) as being anticipated by Lin (USPN 6548393 B1).

Lin teaches a mechanical joint comprising a Cu bump (132, col 8 line 28 – col 10 line 5 and figure 4J) and columnar Pb:Sn solder (152,154) between a die and a substrate (panel, col 10 lines 56-64 or circuit board, col 11 lines 1-9), exposed to microwave energy and reflowed with radiant energy (col 10 lines 10-49). However it is noted that the structure of the joint is the same regardless of the type of reflow employed. A joint formed by convection reflow has same structure and properties as a microwave reflow joint. However in the instant claims the assembly will presumably be exposed to microwave radiation in the future, no exposure has occurred at this point. Although the reference teaches electroplating metals, a screen-printed bump would have similar characteristics.

6. Claims 14-17 and 20-23 are rejected under 35 U.S.C. 102(e) as being anticipated by Farooq et al. (USPN 6541305 B2).

Farooq teaches a mechanical joint comprising a bump and solder paste between a die and a substrate (col 1 lines 5-20). The bump has a columnar form (col 6 lines 7-13) and comprises Pb:Sn, Sn:Ag or Sn:Ag:Cu solder (col 5 lines 7-32). The structure of the joint is the same regardless of the type of reflow employed. A joint formed by vapor phase reflow has same structure and properties as a microwave reflow joint. However in the instant claims the assembly will presumably be exposed to microwave radiation in the future, no exposure has occurred at this point.

7. Claims 14-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Chandran et al. (US 2005/0116329 A1).

Chandran teaches a mechanical joint comprising a bump and solder paste between a die and a substrate (paragraph 2). The bump has a columnar form and comprises Cu, Pb:Sn or Sn:Ag solder (paragraphs 16 and 19-21). The structure of the joint is the same regardless of the type of reflow employed. A joint formed by vapor phase reflow has same structure and properties as a microwave reflow joint. However in the instant claims the assembly will presumably be exposed to microwave radiation in the future, no exposure has occurred at this point. Although the reference teaches electroplating metals, a screen-printed bump would have similar characteristics.

Response to Arguments

8. In response to applicant's argument that the claims teach a self-aligned mechanical joint exposed to microwave energy, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim.

It is noted that the term "reflows" is used which indicates a conventional joint which will be subject to microwave energy at some point in the future. However, had the joint been exposed to microwave energy, the resulting product would be identical. There is

no indication of unexpected results by reflowing with microwave energy as opposed to convection or laser reflow. The instant claims are not method claims.

Therefore the 102 rejection of claims 14-17 as anticipated by Casson stands and includes new claims 19- 21.

Therefore the 102 rejection of claims 14-17 as anticipated by Sweitzer stands and includes new claims 19 and 21.

Therefore the 102 rejection of claims 14-17 as anticipated by Koopman stands and includes new claims 19 and 21.

Therefore the 102 rejection of claims 14-17 as anticipated by Lin stands and includes new claims 19- 21.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Jackson et al. (USPN 6333563 B1, joint, Cu column, Pb :Sn, Sn :Ag and Sn :Ag :Cu), Gaynes et al. (USPN 6165885, joint with electroplated column, Pb:Sn, Sn:Ag and Sn:Ag:Cu) and Bernardoni et al. (USPN 5172852, obvious microwave reflow variations, IR, convective, conductive, hot bar, etc.).

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynne Edmondson whose telephone number is (571) 272-1172. The examiner can normally be reached on Monday through Thursday from 6:30 a.m. to 5 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on (571) 272-1171. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Lynne Edmondson LRE
Primary Examiner
Art Unit 1725 11/17/05

LRE